

## SEQUENCE LISTING

## (1) GENERAL INFORMATION:

## (i) APPLICANT:

(A) NAME: Hoechst Aktiengesellschaft  
(B) STREET: -  
(C) CITY: Frankfurt  
(D) FEDERAL STATE: -  
(E) COUNTRY: Germany  
(F) POSTAL CODE: 65926  
(G) TELEPHONE: 069-305-3005  
(H) TELEFAX: 069-35-7175  
(I) TELEX: 41234700 ho d

(ii) TITLE OF APPLICATION: Dictyocaulus viviparus Antigen zur Diagnose des Lungenwurmbefalls und zur Vakzinierung [Dictyocaulus viviparus antigen for the diagnosis of lungworm infestation and for vaccination]

(iii) NUMBER OF SEQUENCES: 30

## (iv) COMPUTER-READABLE FORM:

(A) MEDIUM TYPE: Floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25 (EPO)

## (2) INFORMATION FOR SEQ ID NO: 1:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7 Amino acids  
(B) TYPE: Amino acid  
(C) STRANDEDNESS: Single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

Ser Glu Ser Leu Tyr Glu Lys  
1 5

## (2) INFORMATION FOR SEQ ID NO: 2:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7 Amino acids  
(B) TYPE: Amino acid  
(C) STRANDEDNESS: Single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

## (ix) FEATURES:

(A) NAME/KEY: Protein  
(B) LOCATION: 1..7

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

Met Met Asp Asn Phe Val Lys  
1 5

(2) INFORMATION FOR SEQ ID NO: 3:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 14 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..14

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

Tyr Lys Asp Glu Asn Glu Phe Met Asp Ala Leu Lys Gln Lys  
1 5 10

(2) INFORMATION FOR SEQ ID NO: 4:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 20 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

Tyr Asp Ile Pro Glu Gln Tyr Arg Glu Ile Ile Pro Gln Asn Val Ala  
1 5 10 15  
Glu His Leu Lys  
20

(2) INFORMATION FOR SEQ ID NO: 5:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 26 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein

(B) LOCATION: 1..26

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

Asp	Ala	Ile	Glu	Lys	Tyr	Glu	Asp	Ile	Pro	Glu	Gln	Tyr	Arg	Glu	Ile
1				5					10					15	
Ile	Pro	Gln	Asn	Val	Ala	Glu	His	Leu	Lys						
			20					25							

(2) INFORMATION FOR SEQ ID NO: 6:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 18 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..18

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Phe	His	Ala	Glu	Leu	Leu	Ala	Gly	Ile	Lys	Pro	Ser	Leu	Glu	Glu	Leu
1				5					10					15	
Lys	Lys														

(2) INFORMATION FOR SEQ ID NO: 7:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 14 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..14

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Gln	Phe	Pro	Ile	Leu	Thr	Ser	Val	Phe	Ser	Asn	Glu	Glu	Lys
1				5					10				

(2) INFORMATION FOR SEQ ID NO: 8:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 21 Base pairs
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..21

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

TCNGARUCNY TNTAYGARAA R

21

(2) INFORMATION FOR SEQ ID NO: 9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..21

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

ATGATGGAYA AYTTYGTNAA R

21

(2) INFORMATION FOR SEQ ID NO: 10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 42 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..42

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

TAYAARGAYG ARAAYGARTT YATGGAYGCN YTNAARCARA AR

42

(2) INFORMATION FOR SEQ ID NO: 11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 60 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..60

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

TAYGAYATHC CNGARCARTA YMGNGARATH ATHCCNCARA AYGTCNGCNGA RCAYYTNAAR 60

## (2) INFORMATION FOR SEQ ID NO: 12:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 78 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..78

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

GAYGCNATHG ARAARTAYGA RGAYATHCCN GARCARTAYM GNGARATHAT HCCNCARAAY 60

GTNGCNGARC AYYTNAAR 78

## (2) INFORMATION FOR SEQ ID NO: 13:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 54 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..54

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

TTYCAYGCNG ARYTNYTNGC NGGNATHAAR CCNTCNYTNG ARGARYTNAA RAAR 54

## (2) INFORMATION FOR SEQ ID NO: 14:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 42 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURES:

- (A) NAME/KEY: exon

(B) LOCATION: 1..42

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

CARTTYCCNA THYTNACNTC NGTNTTYTCN AAYGARGARA AR

42

(2) INFORMATION FOR SEQ ID NO: 15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..29

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

CCGGAATTCG AYGCNATNGA RAARTAYGA

29

(2) INFORMATION FOR SEQ ID NO: 16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7 Amino acids
- (B) TYPE: Amino acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

(ix) FEATURES:

- (A) NAME/KEY: Protein
- (B) LOCATION: 1..7

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

Asp Ala Ile Glu Lys Tyr Glu  
1 5

(2) INFORMATION FOR SEQ ID NO: 17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 Base pairs
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURES:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..29

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

CGCGGATCCG ARATNATNCC NCARAAYGT

29

(2) INFORMATION FOR SEQ ID NO: 18:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..7

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

Glu Ile Ile Pro Gln Asn Val  
1 5

(2) INFORMATION FOR SEQ ID NO: 19:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 29 Base pairs
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

- (ix) FEATURES:
  - (A) NAME/KEY: exon
  - (B) LOCATION: 1..29

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

CCGGAATTCT AYAARGAYGA RAYGARTT

29

(2) INFORMATION FOR SEQ ID NO: 20:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..7

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

Tyr Lys Asp Glu Asn Glu Phe  
1 5

(2) INFORMATION FOR SEQ ID NO: 21:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 31 Base pairs
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

- (ix) FEATURES:
  - (A) NAME/KEY: exon
  - (B) LOCATION: 1..31

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

AAAAGTGCAG NGCRTCCATR AAYTCRTTYT C

31

(2) INFORMATION FOR SEQ ID NO: 22:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..7

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

Ala Asp Met Phe Glu Asn Glu  
1 5

(2) INFORMATION FOR SEQ ID NO: 23:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 31 Base pairs
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

- (ix) FEATURES:
  - (A) NAME/KEY: exon
  - (B) LOCATION: 1..31

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

AAAAGTGCAG YTTYTCYTCT TTRCTRAANA C

31



## (2) INFORMATION FOR SEQ ID NO: 24:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: Protein
- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..7

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

Lys Glu Glu Asn Ser Phe Val  
 1 5

## (2) INFORMATION FOR SEQ ID NO: 25:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 32 Base pairs
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA (genomic)
- (ix) FEATURES:
  - (A) NAME/KEY: exon
  - (B) LOCATION: 1..32

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

GACATGCATG TAGACGCACT TGGAGAAGAG GC

32

## (2) INFORMATION FOR SEQ ID NO: 26:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 8 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: Protein
- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..8

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

Val Asp Ala Leu Gly Glu Glu Ala  
 1 5

## (2) INFORMATION FOR SEQ ID NO: 27:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 36 Base pairs
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

- (ix) FEATURES:
  - (A) NAME/KEY: exon
  - (B) LOCATION: 1..36

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:

CCGGAATTCC CTGAACAGTA CAGAGAGATC ATTCCA

36

## (2) INFORMATION FOR SEQ ID NO: 28:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 9 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
  - (A) NAME/KEY: Protein
  - (B) LOCATION: 1..9

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

Pro Glu Gln Tyr Arg Glu Ile Ile Pro  
1 5

## (2) INFORMATION FOR SEQ ID NO: 29:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 560 Base pairs
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

- (ix) FEATURES:
  - (A) NAME/KEY: exon
  - (B) LOCATION: 1..562

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

TGGAGAARTA CGAAGATATT CCTGAACAGT ACAGAGAGAT CATTCCACAA AACGTGGCCG	60
AGCATTTAAA ATCGATAACT CAGGAAGAGA AAAAAAGTGCT CAAAGAATTT GTTAAAGACT	120
ATGCAAAATA CAAAGATGAA AATGAGTTCA TGGACGCATF AAAGCAAAAA TCTGAAAGCC	180

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TTTATGAGAA AGCTAAAAAA CTTCAAGATT TGCTGAAATC AAAAGTAGAC GCACTTGGAG      240
AAGAGGCAAA ACAATTTGTG ATGAAGCTTA TCGCTGAGGC TCGTAAATTC CACGCAGAGC      300
TACTGGCCGG CATCAAACCA TCGCTAGAAG AACTAAAAGC CGTCGCTAAA AAGCATATTG      360
AAGAGTTTGA GAAGTTATCA GATGCAGCTA AAGATGATTT CAAAAAGCAA TTCCCTATCC      420
TCACATCCGT GTTCAGCAAT GAAAAAGCAA AGAAAATGAT GGACAACTTT GTGAAAAATT      480
AAAGTTGTAT GATTTCAGG ATATGAAATA AATGTTAAAT TGAAAAAAA AAAAAAAAAA      540
AAAAAAAAA AAAAAAAAAA AG                                             562

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## (2) INFORMATION FOR SEQ ID NO: 30:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 159 Amino acids
  - (B) TYPE: Amino acid
  - (C) STRANDEDNESS: Single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: Protein

- (ix) FEATURES:
- (A) NAME/KEY: Protein
  - (B) LOCATION: 1..159

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

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Glu Lys Tyr Glu Asp Ile Pro Glu Gln Tyr Arg Glu Ile Ile Pro Gln
1           5           10           15
Asn Val Ala Glu His Leu Lys Ser Ile Thr Glu Glu Glu Lys Lys Val
20           25           30
Leu Lys Glu Phe Val Lys Asp Tyr Ala Lys Tyr Lys Asp Glu Asn Glu
35           40           45
Phe Met Asp Ala Leu Lys Gln Lys Ser Glu Ser Leu Tyr Glu Lys Ala
50           55           60
Lys Lys Leu Gln Asp Leu Leu Lys Ser Lys Val Asp Ala Leu Gly Glu
65           70           75           80
Glu Ala Lys Gln Phe Val Met Lys Leu Ile Ala Glu Ala Arg Lys Phe
85           90           95
His Ala Glu Leu Leu Ala Gly Ile Lys Pro Ser Leu Glu Glu Leu Lys
100          105          110
Ala Val Ala Lys Lys His Ile Glu Glu Phe Glu Lys Leu Ser Asp Ala
115          120          125
Ala Lys Asp Asp Phe Lys Lys Gln Phe Pro Ile Leu Thr Ser Val Phe
130          135          140
Ser Asn Glu Lys Ala Lys Lys Met Met Asp Asn Phe Val Lys Asn
145          150          155

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